

What is claimed is:

- 5 1. A holder for radioactive substances, comprising a first container, a second container and shielding means, wherein the first container is provided with first sealing means for liquid and gas tight closing said container, wherein the second container is provided with second sealing means for liquid and gas tight enclosing the first container within the second container, wherein the shielding means is
10 positioned at least partly on the outside of the second container and is essentially impenetrable to radioactive radiation.
2. The holder of claim 1, wherein the shielding means comprises a third container for enclosing the first and second container.
- 5 3. The holder of claim 2, wherein the second container is permeable to at least some types of radioactive radiation, wherein the second container is retractable from the shielding means for measurement of the radiation of a radioactive substance contained within the first container positioned in said second container.
- 20 4. The holder of claim 1, 2, or 3, wherein the first container is essentially made of glass, the second container essentially of plastic material, and the shielding means essentially of metal.
- 25 5. The holder of claim 1, 2, or 3, wherein the first and second container both have a septum, the septum of the second container during use being situated at least partly over the septum of the first container, both septa being pierceable approximately simultaneously by a needle.
- 30 6. The holder of claim 4, wherein the first and second container both have a septum, the septum of the second container during use being situated at least partly over the septum of the first container, both septa being pierceable approximately simultaneously by a needle.
- 35 7. The holder of claim 5, wherein the second container has a lid, wherein the septum of the second container is clamped at least between the upper edge of the wall of the second container and the lid.

8. The holder of claim 2, wherein the shielding means are provided with a stop, during use being positioned over at least part of the septum of the second container, which stop is retractable for engagement of said septa with a needle or the like.

9. The holder of claims 1, 2, or 3, wherein the second container is provided with means for engagement with the third container, for preventing rotation of the second container inside and relative to the third container, wherein the lid of the second container is provided with engagement means for removal of said lid from said second container without the necessity of manual engagement of said lid by an operator.

10. The holder of claim 9, wherein the lid is at least partly provided with a circumferencial edge, having a number of notches or openings for engagement with openings or notches of a set of pliers for opening and closing said lid.

11. The holder of claims 1, 2, or 3, wherein the first and second container are made of material which can be used in an autoclave.

12. The holder of claim 2, wherein the shielding means comprises a third container and at least a fourth container, the fourth container forming at least part of storage and/or transporting means for the further containers.

13. A kit comprising a holder as described in claim 1 and an instrument for engagement of the holder, provided with means for engagement of a radioactive substance within the first container without manually engaging said containers.

14. The use of a holder as described in claim 1, wherein a radioactive substance is enclosed liquid and air tight within the first and second container, which are enclosed within the shielding means, whereby upon use for assessment of the radiation of said substance said shielding means is removed at least partly from said first and second container, after which the radiation of said substance is measured through said first and second container.

15. The use of a holder as described in claim 1 wherein the first and second container are provided with at least partly overlying septa, wherein a radioactive substance is enclosed liquid and air tight within the first and second container, the first container being enclosed air and liquid tight with the second, which are enclosed within the shielding means, whereby upon use of said substance said shielding means is removed at least partly from said first and second container, after which at least part of said substance is removed from said first container and/or a further substance is introduced into said first container through said septa.

16. A method for shielding a radioactive substance, comprising the steps of:

- (a) positioning the substance within a first container,
- (b) closing the first container liquid and air tight with a first lid,
- (c) positioning said first container within a second container,
- (d) closing said second container liquid and air tight with a second lid,
- (e) positioning said first and second container in a shielding means, comprising a third container, and
- (f) closing said shielding means around the entire first and second container.

17. The method of claim 16, wherein a glass container is used as the first container, a plastic material is used as a second container, and a metal container is used as a shielding means.

18. The method of claims 16 or 17, wherein a liquid is introduced between the first and second container, after which at least the first and second container are positioned in an autoclave or like sterilization means and are sterilized, the first container containing said substance.

19. An assembly for dispensing radioactive substances comprising a holder as described in claim 3 and a dispensing instrument, said dispensing instrument being provided with a casing in which the third container can be enclosed.

20. The assembly of claim 19, in which the casing is suspended on a pivot axis, extending during use approximately horizontal, means being provided for retaining the casing in a first, upright position and in a second, upside down position.